REMARKS

Favorable reconsideration of this application is respectfully requested in view of the above amendments and following remarks. Claims 2 and 21 are amended, claims 11 and 22 are canceled without prejudice or disclaimer, and the specification is revised to address informalities. Claims 1, 2, 11-16, and 21-26 were examined and claims 27-30 are considered withdrawn. Claims 1, 2, 12-16, 21, and 23-30 are pending.

Regarding the IDS filed March 15, 2006, Applicant appreciates the Examiner's consideration of the references. However, Applicant notes that the IDS was not completely initialed, and respectfully requests that a completely initialed copy be included in the next action to confirm that all of the references in the March 15 IDS have been considered.

The specification is objected to for informalities. The specification has been amended as suggested by the Examiner. Withdrawal of the objection is respectfully requested.

Claims 2, 11, and 21-26 were rejected for lacking enablement. The rejection is rendered moot as the language at issue in claims 2 and 21 has been deleted, and claims 11 and 22 have been canceled. Withdrawal of the rejection is respectfully requested.

Claims 1, 2, 11, and 12 are rejected as being anticipated by Wahlsten et al. Applicant respectfully traverses this rejection to the extent it is maintained.

The rejection contends that Wahlsten et al. teaches fusion proteins for inducing response to tumor cells, wherein a superantigen, TSST1 is fused to the transmembrane (TM) region of the proto-oncogene c-*erb*-B-2 and that the reference meets the limitations of the claims. Applicant respectfully disagrees and contends that Wahlsten et al. does not satisfy the claimed features for at least the following reasons.

Wahlsten et al. discloses that crystallographic studies have demonstrated that residues within the TSST1 N-terminal domain directly interact with MHC II molecules, and mutation analyses of TSST1 have residues critical for its superantigenic activity to the C-terminal domain. Further, when expressed as a recombinant protein, the TSST1 C-terminal residues 88-194 do not bind to MHC II molecules yet retain superantigenic activity. See page 6762, left column, lines 14-20 of the reference. In fact, such binding between TSST1 and MHC II molecules is not necessary for TSST1 to be used as an anti-

cancer medicine. Thus, the reference does not satisfy an interaction of fusion protein of superantigen and a tumor specific ligand as claimed, namely a ligand that stimulates cancer cell growth and corresponds to receptors overexpressed by cancer cells, or a screened peptide that is affinitive to or antagonist to cancer cell receptors, or a peptide that directly interacts with cancer cell surface. While TSST1 may bind to MHC II molecules, such teaching by Wahlsten et al. is not an interaction that targets cancer cells and the reference is further removed from the claims. In fact, Wahlsten et al. does not target cancer cells through the interaction of TSST1 with MHC II. For example, it is known that some cancer cells do not express MHC II (e.g. MHC II-negative tumor cells). See top of page 6761, line 7 of the reference. Further, normal cells also express MHC II which further shows that the interaction of TSST1 with MHC II does not specifically target or differentiate between cancer cells and other cells (i.e. non-cancerous cells). When normal cells are present such as when the superantigen would be used in treatment, use of a superantigen in such a manner would have great side effects.

Wahlsten et al. also describes using c-*erb*-B-2 TM (transmembrane) region to target TSST1 superantigen to cancer cells, where many of the amino acid residues in the TM region are hydrophobic and interact with a cell membrane to attach the fusion protein on the surface of the cell membrane. However, such teaching from Wahlsten et al. also does not satisfy claim 1. Wahlsten et al. discusses always linking the TM region with a cell membrane. For example, Wahlsten et al. says that "[s]ince increasing hydrophobicity will change a translocating sequence into a stop-anchor sequence, we hypothesized that fusing TSST1 to a hydrophobic TM region sequence would permit it to passively anchor onto cell membranes of living cells." See page 6761 last line to page 6762, line 4 of left column. Likewise, "[b]ecause the hydrophobic TM region sequence mediates this passive anchoring, HTSST1-TM and HT84-TM should associate with most cells or tumors." See page 6765 last four lines of first column.

Thus, Wahlsten et al. provides no disclosure that specifies a fusion protein that requires the ligand and superantigen features required by the claim and which can enjoy the benefit of specifically targeting cancer cells. Rather, the reference merely provides discussion that anti-cancer effect may be induced when only cancer cells are present. However, the cited reference is deficient in that TSST1-TM also can affect normal cells,

because all animal cell membranes are hydrophobic, as with cancer cell membranes. As TSST1-TM obviously interacts with normal cells when present, Wahlsten et al. does not have specificity, namely because the interaction of hydrophobic TM sequence and membranes is not a specific interaction between the receptor and the ligand. For at least the foregoing reasons, Applicants respectfully submits that Wahlsten et al. fails to satisfy the claimed features, and that claims 1, 2, and 12 are distinguished.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1, 2, 11-16, and 21-26 are rejected as being obvious over Wahlsten et al. (above) in view of Chandler et al. Applicant respectfully traverses this rejection to the extent it is maintained.

The deficiencies of Wahlsten et al. have been explained in detail above with respect to claims 1, 2, and 12. For example, Wahlsten et al. does not disclose the fusion protein including a superantigen and ligand as recited by claim 1. As explained, the reference fails to provide specificity in the binding of the fusion protein and cancer cells. One of skill in the art would understand that such fusion proteins as described by Wahlsten et al. do not target cancer cells, since the fusion proteins bind with all types of cells including normal cells. As a result, such a fusion protein would not be practical for treating cancer, where the claimed invention provides for such a benefit. Applicant respectfully submits that Chandler et al. does not further a rejection of these claims, and that claim 1 and its dependent claims 2 and 12-16 are patentable for at least the reasons already discussed.

Regarding claims 21-26, remaining claims 21 and 23-26 are allowable for at least the following reasons. Wahlsten et al. is deficient for at least the reasons noted above, and this rejection further states that Wahlsten et al. does not teach a member of the epidermal growth factor family fused to the superantigen SEA. Chandler et al. does not further a rejection of claims 21 and 23-26 for at least the following reasons. Chandler et al. discloses a fusion protein with toxin protein SAP and a ligand. However, SAP is not a superantigen, and the reference merely describes a fusion protein that may include a heparin-binding epidermal growth factor (HB-EGF). In fact, there is nothing in the references to suggest making such a combination, and the rejection does not provide any

suggestion that one part of a fusion protein is replaceable by a protein with different characters, namely replacing a toxin protein SAP with a superantigen in Wahlsten et al. in combining with an EGF ligand so as to arrive at the fusion protein claimed. Furthermore, Wahlsten et al. does not provide a reliable cancer treatment strategy, and therefore one of skill in the art would not look to combining the references cited in arriving at the claims. For at least the foregoing reasons, there is no reasonable suggestion that these references would be combined in the manner alleged by the Examiner. Applicant respectfully submits that remaining claims 1, 2, 12-16, 21, and 23-26 are allowable.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

With regard to added claims 27-30, Applicants respectfully request that these claims be reinstated at least because they include the limitations of claim 21.

In view of the above amendments and remarks, Applicant believes that the pending claims are in a condition for allowance. Applicant respectfully requests favorable consideration of the claims in the form of a Notice of Allowance. If any questions arise regarding this communication, the Examiner is invited to contact Applicant's representative listed below.

Respectfully submitted,

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